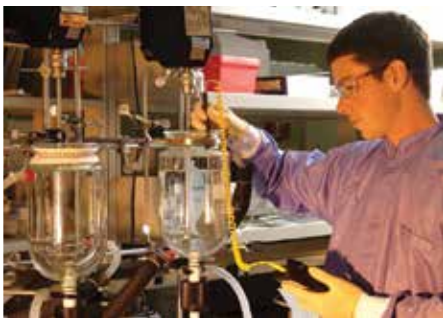
NCBIOTECH/funding

2012 Awards Report





North Carolina Biotechnology Center

Contents

Introduction

To grow the state's bioscience industry, the North Carolina Biotechnology Center awards grants and loans at specific points in the development of ideas from the mind to the marketplace. For fiscal year 2012 (July 2011 to June 2012), NCBiotech awarded more than $8.6 million in funding to universities, education programs, businesses, and community development efforts.

Read more about our programs at *ncbiotech.org/grants* and *ncbiotech.org/loans*.

Biotechnology Event Sponsorship

ORGANIZATION / PRIMARY	PROJECT TITLE	PUBLIC INFORMATION SUMMARY	GRANT AMOUNT
Association of Clinical Research Professionals / Moser, Ro	**Building Quality in Clinical Research**	The conference was an opportunity for clinical research professionals to interact with other professionals and community members from different organizations to share ideas and learn from each other. Attendees left with an understanding of emerging trends in clinical research and their role in conducting research ethically and responsibly.	$1,000
David H. Murdock Research Institute / Ghelani, Sheetal	**2nd Annual TRIMR Symposium**	A one-day conference discussing new technological developments and applications in the field of nuclear magnetic resonance (NMR) spectroscopy. A variety of speakers from academic and government laboratory research groups across the region presented their current research highlights and recent scientific discoveries.	$1,000
Duke University / Cullen, Bryan	**Symposium on RNA Biology IX: RNA Tool and Target**	The Symposium on RNA Biology IX: RNA Tool and Target is a small biennial meeting focused on the biology of ribonucleic acid (RNA), its use as a research tool, and its potential as a therapeutic target. The meeting focused on attracting young scientists and groups underrepresented in science.	$1,500
Duke University / Zuiker, Anton	**ScienceOnline 2012**	ScienceOnline 2012 was the sixth annual international meeting on science. This Web Event brought together more than 450 scientists, students, educators, physicians, journalists, librarians, bloggers and others interested in the way the Web is changing the way science is communicated, taught and done.	$2,500
East Carolina University / Farwell, Mary	**State of North Carolina Undergraduate Research and Creativity Symposium: SNCURCS 2011**	This was the seventh annual SNCURCS Conference for undergraduate researchers. Undergraduates from all N.C. colleges and universities, both public and private, submitted abstracts for publication in the program and present either poster or oral presentations of their research.	$1,000
East Carolina University / O'Brien, Maryellen	**The Society of Research Administrators, North Carolina Chapter (NCSRA) 17th Annual Conference—Beyond Survival: Transformers of Tomorrow**	The Society of Research Administrators International, North Carolina Chapter's (NCSRA) 17th Annual Conference addresses research administration in transition as we close out American Recovery and Reinvestment Act (ARRA) projects and support engagement in rigorous competition for research funding.	$1,200
Kannapolis City Schools / Boyd, Ellen	**Kannapolis City Schools Biotechnology Academy Grand Opening**	The Grand Opening of Kannapolis City Schools Biotechnology Academy was held Sunday, Sept. 25. The facility features state-of-the-art equipment, unparalleled science instruction, and strong collaboration with the North Carolina Research Campus. Tours were available and attendance was free.	$1,500
North Carolina Academy of Science, Inc. / Guzman, Karen	**109th Annual Meeting of the North Carolina Academy of Science**	For 109 years, the North Carolina Academy of Science has provided an annual venue for students and professionals from around the state to share their excitement for science. The theme of the meeting was "Environmental Stewardship."	$1,500
North Carolina Association for Biomedical Research / Wilkison, Suzanne	**IACUC 2012**	NCABR's "IACUC 2012" Conference provided biotechnology and biomedical researchers involved with institutional animal care and use committees with the professional development and training that is required of them by federal regulations.	$3,000
North Carolina State University / Schenkman, Laura	**2011 Molecular Biotechnology Research Symposium**	This symposium featured presentations (posters and oral) by graduate students enrolled in the Molecular Biotechnology Training Program (MBTP). The afternoon session included distinguished speakers from NCSU, the RTP area, and the nation discussing the latest developments in the life sciences and biotechnology research.	$1,500
North Carolina State University / Day, Judy	**North Carolina State University Undergraduate Research Symposium 2012**	The 21st NC State University Undergraduate Research Symposium showcased the hands-on scholarship of students at the University that have worked with mentors both on and off campus to create new knowledge in their field. These students are interested in admission to graduate and professional schools or in seeking excellent employment. Approximately 80% of these students are in disciplines linked to biotechnology.	$990
North Carolina State University / DiMeo, Andrew	**6th Annual Biomedical Engineering Symposium**	The Biomedical Engineering Symposium consisted of poster and oral presentations covering a variety of student designed biomedical devices. The presentations were delivered by the senior design classes from both NCSU and UNC – Chapel Hill.	$1,000
Technology Partnership of Nagoya University, Inc. / Azama, Kishu	**Regenerative Medicine Roundtable**	A half day technology showcase event focusing on regenerative medicine by UNCC, Wake Forest University, and Nagoya University, Japan. Six technologies were presented in addition to the keynote speech by Dr. Tim Bertram, CSO at Tengion which is one of the premiere research companies in the regenerative medicine field.	$1,500

ORGANIZATION / PRIMARY	PROJECT TITLE	PUBLIC INFORMATION SUMMARY	GRANT AMOUNT
UNC – Chapel Hill / Ashby, Valerie	**2011 North Carolina Alliance to Create Opportunity Through Education (NC OPT-ED) Tenth Annual Alliance Day Conference**	Professional one-day interactive conference with a focus on science, technology, engineering and mathematics (STEM) disciplines. It targets advanced educational opportunities for middle school, high school, undergraduate and graduate students with special emphasis on population groups underrepresented in STEM fields. One of the focus areas is biotechnology and its career pathways.	$1,000
UNC – Chapel Hill / Goldstein, Bob	**Microtubules and Cellular Functions Event**	"Microtubules and Cellular Functions" comprised an open lecture and a networking reception to benefit the Triangle academic and biotechnology community.	$1,000
UNC – Chapel Hill / Goldstein, Bob	**Molecular Mechanisms of Endocytosis Event**	"Molecular Mechanisms of Endocytosis" comprised a public lecture and a reception for the benefit of the Triangle academic and biotechnology community.	$800
UNC – Chapel Hill / Maeda, Nobuyo	**Integrative Vascular Biology(IVB) and UNC McAllister Heart Institute (MHI) Annual Symposium**	Every year, the Integrative Vascular Biology Program (IVB) and the McAllister Heart Institute (MHI) come together and host the IVB/MHI Annual Cardiovascular Research Symposium. This year, the symposium was held on March 20, 2012, at the University of North Carolina at Chapel Hill. Over the past several years, the IVB/MHI symposium has attracted a wide variety of researchers from diverse fields and at all levels of training.	$1,500
UNC – Chapel Hill / Caron, Kathleen	**2nd Annual Oliver Smithies Nobel Symposium – Presentation by Invited Nobel Laureate, Thomas Cech, PhD**	This annual event hosts a Nobel Laureate to speak at UNC – Chapel Hill, sharing inspiring stories and highlighting critical experiences that led to his or her successes, thus providing inspiration to a new generation.	$1,500
UNC – Chapel Hill / Hall, Joshua	**North Carolina DNA Day 2012**	North Carolina DNA Day is an annual event where N.C. high school students learn about genetics, genomics, and biotechnology. On April 20th, scientists from N.C.'s leading research universities and institutions visited over 100 high schools statewide to present engaging hands-on activities which reinforce the N.C. Standard Course of Study.	$3,000
UNC – Chapel Hill / Segal, Richard	**First Annual UNC – NCSU Rehabilitation Engineering Symposium: Engineering a World Class Rehabilitation Center**	This symposium will facilitate communication and collaboration among people working in and using rehabilitation engineering in the Triangle area. Individuals presented their interests with brief presentations of their focus, research results and/or examples of engineering design projects that help people with disabilities.	$1,334
UNC – Chapel Hill / Earp, Shelton	**The 36th Annual UNC Lineberger Comprehensive Cancer Center Symposium – Cancer Therapies and New Drug Targets**	The 36th Annual UNC Lineberger Symposium brought together nationally and internationally recognized cancer researchers from both pharmaceutical companies and academic institutions to focus on new and innovative approaches for cancer therapy.	$3,000
UNC – Charlotte / Montague, Jennifer	**Greater Charlotte Region Life Sciences and BioEngineering Graduate Student Career Symposium**	This symposium provided insight into a wide variety of career options for life science and bioengineering graduate students. Career-level individuals discussed their educational and training background, previous job experiences that led them to their current position, and what their current position entails.	$1,000
Wake Forest University Health Sciences / Yoo, James	**13th Annual North Carolina Tissue Engineering and Regenerative Medicine Society (NCTERMS) Conference**	The NCTERMS 2011 conference was a dynamic event attracting academic and industry professionals to stay current in research and development in regenerative medicine, to network with colleagues, to obtain new learning on opportunities in translational bioscience in N.C., and to promote employment and personnel exchange within the State.	$1,500
		Total BIOTECHNOLOGY EVENT SPONSORSHIP (23 items)	**$34,824**

Biotechnology Meeting Grant

ORGANIZATION / PRIMARY	PROJECT TITLE	PUBLIC INFORMATION SUMMARY	GRANT AMOUNT
Duke University Medical Center / Gregory, Simon	**Duke Bioinformatics Workshop**	The finished sequence of the human genome represents an invaluable resource that is greatly accelerating scientific research. The Duke Bioinformatics Workshop provided participants with the expertise to efficiently explore this myriad of information and included topics that reflect advances in technological development.	$3,000
Forsyth Technical Community College / Read, Russel	**Toward Certification and Career Pathways in the Biosciences**	Currently there is no basic certification system for bioscience workers, especially R&D and bio-manufacturing technicians. At this meeting recognized experts from around the country worked on establishing an industry-recognized, nationally-portable bioscience certification system that will be endorsed by the National Association of Manufacturers.	$7,500
ibiliti / Poorboy, Ann	**medtech 11**	400 of the industry's top leaders came to talk about the regional strengths and industry challenges and to network and collaborate to make us stronger and more competitive globally. The impact of baby boomers on healthcare and technology were common themes for discussion during the conference.	$5,000
North Carolina Agricultural Foundation, Inc. / Maxwell, Catherine	**Stewards of the Future: Research for Human Health and Global Sustainability**	The conference convened leaders in the biotechnology, agriculture, health, education and public sectors to hear world class speakers address global challenges, showcase N.C. research, and promote increased collaboration in the agricultural, health and biotechnology sectors.	$5,000
North Carolina Association for Biomedical Research / Wilkison, Suzanne	**The 3 I's (IACUCs, IBCs, IRBs) and Bioethics: Animals, Humans, Science & Society—Building a Culture of Trust and Shared Responsibility**	The NCABR and the Massachusetts Society for Medical Research hosted "The Three I's (IACUCs, IBCs, IRBs) and Bioethics: Animals, Humans, Science & Society –Building a Culture of Trust and Shared Responsibility," on Sept. 18-20, 2011, at The Carolina Inn in Chapel Hill, N.C.	$5,000
North Carolina Center of Innovation for Nanobiotechnology / Faulconer, Laura	**Commercialization of Micro-Nano Systems Conference 2011 (COMS 2011)**	The Commercialization of Micro-Nano Systems Conference 2011 (COMS 2011), held in Greensboro, was the 16th international conference focused on commercialization of small technology.	$5,000
North Carolina Center of Innovation for Nanobiotechnology / Ossey, Graeme	**Nanotechnology Commercialization Conference**	Nanotechnology is an enabling technology with huge potential to advance technologies in many different industries including biotechnology, agricultural technology and energy industries. The 2012 NCC brought the leading stakeholders in nano and these industries to Durham with the goal of turning these ideas into commercial products.	$5,000
North Carolina State University / Lila, Mary Ann	**6th International Workshop on Anthocyanins, 2011 (IWA2011)**	Leading scientists from around the world met at the North Carolina Research Campus in Kannapolis, N.C. for the International Workshop on Anthocyanins (IWA), a biennial event which has previously been hosted only in Australasia (Australia, New Zealand, and Japan). The conference presented the latest research developments in the biosynthesis and in situ functionality of anthocyanins in plants, biotechnology and molecular biology of pigments, the human health benefits linked to consumption of anthocyanin-rich produce, industrial applications, and more.	$4,000
UNC – Chapel Hill / Church, Frank	**6th International Symposium on the Chemistry and Biology of Serpins**	This Symposium brought together basic and clinical scientists to discuss the history and future of serpins in multiple physiological areas and provided an opportunity for graduate students, postdoctoral fellows and clinical fellows in this field to present their work.	$3,000
UNC – Greensboro / Schmitz, Randy	**ACL Research Retreat VI**	The ACL Research Retreat VI is a biennial meeting that examines both risk factors and prevention of significant acute injury to the anterior cruciate ligament (ACL) of the knee. The meeting will continue to strengthen the foundation upon which quality research and clinical interventions can be advanced.	$2,500
Wake Forest University / Preslar, Len	**Wake Forest Schools of Business Biotechnology Conference**	The Wake Forest Schools of Business Biotechnology Conference and Case Competition served as a way for biotechnology and healthcare professionals, firms, students, faculty members, and community leaders to collaborate, learn, and share insights about the future of biotechnology through pertinent speakers, a networking event, and a case competition.	$2,500
		Total BIOTECHNOLOGY MEETING GRANT (11 items)	**$47,500**

Biotechnology Research Grant

ORGANIZATION / PRIMARY	PROJECT TITLE	PUBLIC INFORMATION SUMMARY	GRANT AMOUNT
East Carolina University / Zhu, Yong	**Developing a Method to Control Invasive Animals through Biotechnology**	The PI will develop a platform technology for producing infertile fish that has potential applications for control of invasive species. The method is based on a genetic procedure and will be developed in zebra fish as a model organism. Competitive mating of sterile fish with fertile individuals would eventually reduce overall reproductive capacity achieving the goal of population control of invasive animals.	$75,000
East Carolina University / Virag, Jitka	**Intramyocardial EphrinA1-Fc Reduces Myocardial Infarct Injury**	The investigator will examine the mechanisms by which ephrinA1-Fc provides protection against injury to the heart muscle after blood flow is cut off to the organ and in the absence of reperfusion therapy. The cell signaling pathway intermediates through which ephrinA1-Fc acts to enhance cardiomyocyte survival are as yet unknown. Understanding these mechanisms will reveal the therapeutic potential of ephrinA1-Fc for cardiovascular diseases and stroke, as well as tissue engineering and regenerative applications.	$75,000
UNC – Charlotte / Nesmelova, Irina	**Towards Rational Engineering of Transposon-based Genetic Tools**	The goal of this project is to use biotechnology to improve the tools for gene therapy and other genetic applications. The first step to developing new gene therapies is to understand the structure of important proteins called transposons. The PIs will study the structure of one transposon in order to provide the information needed for transposon engineering.	$75,000
UNC – Greensboro / Kepley, Chris	**Identification and Validation of Novel Therapies for the Inhibition of Atherosclerotic Plaque Lesions**	Atherosclerosis is a chronic inflammatory disease affecting millions of Americans. Treatment of the disease is extremely expensive and contributes to the rising cost of healthcare. The PIs have discovered a potential method to prevent heart attack and stroke due to atherosclerosis. This new discovery has important implications for the development of new ways to treat this disease as it represents a way to prevent the disease that differs from commercially available therapies (e.g., statins). This discovery could lead to paradigm-shifting strategies for preventing one of the most costly and debilitating diseases in humans.	$74,938
Western Carolina University / Bose, Indrani	**Using RNA Interference to Identify New Drug Targets in the Human Pathogenic Fungus, *Cryptococcus neoformans***	*Cryptococcus neoformans*, a fungus that infects immunocompromised patients, may cause fatal meningoencephalitis if left untreated. Current antifungals have little efficacy against this organism. The PIs will identify fungal genes involved in producing disease (virulence factors). Once these genes are identified, new therapeutics may be developed to target these factors. The PIs will construct and screen an RNA interference library to identify novel genes required for melanization (a virulence factor) that could serve as new drug targets.	$70,586
		Total BIOTECHNOLOGY RESEARCH GRANT (5 items)	**$370,524**

Centers of Innovation

ORGANIZATION / PRIMARY	PROJECT TITLE	PUBLIC INFORMATION SUMMARY	GRANT AMOUNT
Center for Innovation for Advanced Medical Technologies (ibiliti) / Clark, Cindy	**Phase II, Renewal Funding**	Exclusively dedicated to North Carolina's advanced medical technology community, ibiliti provides a robust network of resources that links medtech entrepreneurs to the talent, funding and expertise they need to accelerate the development and commercialization process. ibiliti provides ready access to medtech expertise, grant writing assistance, economic development perspectives as well as prototyping and manufacturing options.	$580,000
Center of Innovation for Nanobiotechnology (COIN) / Kundahl, Griffith	**Phase II, Renewal Funding**	COIN is a nonprofit, virtual center of innovation for nanobiotechnology and nanomedicine based in North Carolina. COIN is a premier source of networking opportunities, information, and tailored innovation services that address client needs by catalyzing and advancing commercialization of nanobiotechnology in N.C.	$700,000
Drug Discovery Center of Innovation (DDCOI) / Ehrlich, Paula	**Phase II, Renewal Funding**	A nonprofit, virtual drug discovery and development center focused on providing pharmaceutical expertise to facilitate and accelerate the development of novel therapeutics. DDCOI works to align partners to share risk around mutual objectives through the creation of new models, new companies and novel funding mechanisms.	$300,000
		Total CENTERS OF INNOVATION (3 items)	**$1,580,00**

Centers of Innovation Planning Grant

ORGANIZATION	PROJECT TITLE	PUBLIC INFORMATION SUMMARY	GRANT AMOUNT
Duke University Medical Center / Ginsburg, Geoffrey	**Phase I, Personalized Medicine COI Planning Grant**	By organizing and leveraging the state's capabilities, resources and investments in personalized medicine and providing an organizational framework under which the stakeholders can come together, the N.C. Personalized Medicine Network (NCPMN) will be creating a plan to establish North Carolina as a national leader in the discovery, translation and clinical implementation of personalized medicine.	$100,000
		Total CENTERS OF INNOVATION PLANNING GRANT (1 item)	**$100,000**

Collaborative Funding Grant

ORGANIZATION / PRIMARY	PROJECT TITLE	PUBLIC INFORMATION SUMMARY	GRANT AMOUNT
North Carolina State University / Jameel, Hasan *(Company Partner: Novozymes North America, Inc.)*	**Characterization of Lignin in Non-woody Biomass to Improve Hydrolysis**	The project will provide a fundamental understanding of how the quantity and quality of lignin and lignin-carbohydrate bonds in corn stover, a non-woody biomass, impacts its conversion to sugars. In cooperation with Novozymes, the PIs will be able to effectively optimize corn stover's response to a set of reduced intensity pretreatment conditions for maximizing economics and thereby commercialize it as a biofuel crop.	$100,000
North Carolina State University / Zeng, Zhao-Bang *(Company Partner: Syngenta Biotechnology, Inc.)*	**Multiple Interval Mapping with Epistasis and Marker-Assisted Predictive Breeding**	This project develops statistical methods for studying complex genetics in populations and for designing breeding methods. It will open a new era in plant breeding—breeding by genetic design. The project marries the expertise at NC State University in the study of complex traits with the needs in Syngenta Biotechnology Inc. for plant breeding.	100,000
North Carolina State University Mountain Horticultural Crops Research & Extension Center / Ranney, Thomas *(Company Partner: North Carolina Nursery and Landscape Association)*	**Development and Commercialization of "Carolina" Dogwoods**	This project will develop new disease resistant varieties of dogwood *(Cornus florida)* with commercial characteristics to provide North Carolina producers with a competitive advantage. Traditional breeding methods will be combined with tissue culture protocols for rapid micropropagation and development of polyploidy lines to develop novel traits ideally suited for production in North Carolina.	$100,000
UNC – Chapel Hill / Zeisel, Steven *(Company Partner: Pfizer Nutrition, Inc.)*	**Choline Mediated Signaling and Brain Development**	Pfizer Nutrition, who makes nutrition products for infants, is partnering with Steven Zeisel at UNC, an expert on nutrition and brain development. This collaborative project will examine the mechanisms whereby choline changes brain development. Results will enable the development of enhanced products for infant and maternal feeding.	$100,000
UNC – Chapel Hill / Singleton, Scott *(Company Partner: Synereca Pharmaceuticals)*	**Novel Potentiators of Fluoroquinolones for Gram-negative Pathogens**	Synereca Pharmaceuticals has identified small compounds that increase the effectiveness of antibiotics. They will develop these small molecule inhibitors of DNA repair that enhance killing by fluoroquinolone and demonstrate their utility in crucial *in vivo* infection models. This proof of concept study will enhance Synereca's ability to attract partners and investors.	$100,000
Wake Forest University / Bonin, Keith *(Company Partner: Nanomedica, LLC)*	**Accelerating Drug Discovery: On-chip Selection of DNA-Encoded Chemical Libraries**	The project represents a novel and proprietary NextGeneration Sequencing-enhanced drug discovery platform that promises to dramatically increase the rate of new drug lead identification while reducing costs.	$100,000
		Total COLLABORATIVE FUNDING GRANT (6 items)	**$600,000**

Company Inception Loan

ORGANIZATION / PRIMARY	PROJECT TITLE	PUBLIC INFORMATION SUMMARY	GRANT AMOUNT
Cell Microsystems, Inc. / Morrison, Chris	**Preparation for Commercial Launch of the IsoRaft System**	Cell Microsystems is developing cell sorting technology to enable biomedical research scientists to more effectively separate and examine individual cells. Cell Microsystems will use these CIL funds to develop additional intellectual property, ramp commercial production, and conduct additional primary market research in preparation for outside financing and commercial launch.	$30,000
Eboo Pharmaceuticals Inc. / McNutt, Robert	**Corporate Structure and Business Development**	EPI is developing delta opioid receptor modulators to treat Parkinson's disease, depression, and other conditions. CIL funds will provide resources for developing EPI's corporate structure, supporting intellectual property development, and pursuing business development opportunities.	$30,000
MxBiodevices, LLC / Thompson, Marilyn	**Diabetic Foot Ulcer Business Plan**	MxBiodevices, LLC is an advanced wound care company dedicated to addressing unmet clinical needs resulting from impaired dermal wound healing, particularly as a consequence of diabetes. Mx will use these CIL funds to prepare for financing, including development of a formal business plan and investor slide presentation, preparation of legal documents, and travel.	$30,000
Novametics / Strenkowski, John	**Novametics Company Inception Loan**	Novametics is developing and commercializing innovative blood coagulation diagnostic products. This CIL will support critical activities that will help Novametics attract talented employees, establish a robust product development plan, and accelerate the commercial success of its products.	$30,000
NovaTarg, Inc. / Batchelor, Kenneth	**NovaTarg Corporate Foundation Enhancements**	NovaTarg is developing novel tissue-specific AMPK activators for treating metabolic diseases and cancer. CIL funds will be used to prepare the company for future investment, including filing new patent applications, applying for grant funding, improving external visibility, and creating a formal business plan.	$30,000
		Total COMPANY INCEPTION LOAN (5 items)	**$150,000**

Economic Development Award

ORGANIZATION / PRIMARY	PROJECT TITLE	PUBLIC INFORMATION SUMMARY	GRANT AMOUNT
Salisbury-Rowan Economic Development Commission / Van Geons, Robert	**Economic Development – Project Protein**	This Project will assist the company, a North Carolina-based private contract manufacturing company engaged in the development and manufacturing of pharmaceutical, OTC, therapeutic skin care, and animal health products, to expand its business operations in Rowan County.	$100,000
Town of Morrisville / Whitson, John	**Economic Development – Project Ark**	This Project will assist the company, a U.S. subsidiary of an international medical technology company engaged in the development of devices and clinical applications for the monitoring of respiratory inflammation to improve the management and care of parients with inflammatory airway diseases, to locate its business operations in Morrisville.	$100,000
		Total ECONOMIC DEVELOPMENT AWARD (2 items)	**$200,000**

Education Enhancement Grant

ORGANIZATION / PRIMARY	PROJECT TITLE	PUBLIC INFORMATION SUMMARY	GRANT AMOUNT
Appalachian State University / Cohen, Seth	**Developing Biotechnology Through Fermentation Science at Appalachian State University CO-PI/Dr. Brett Taubman**	This project will develop two courses directly related to biotechnology at ASU, Principles of Fermentation Sciences, and Facility Design and Operation. The award will support the purchase of equipment for a pilot-scale fermentation system. The ASU BS in Fermentation Science is the first such program on the east coast of the United States.	$60,800
Campbell University / Shin, Daniel	**Bioanalytical Equipment for Student Training (BEST)**	This award will enable the purchase of an Ultra High Performance Chromatography (UHPLC) instrument. The coupling of a UHPLC system with an existing mass spectrometer will provide student instruction in one of the most rapid and sensitive techniques available for the separation and analysis of molecules of pharmaceutical interest.	$58,880
Duke University / Noor, Juliet CO-PI/Dr. Mohamed Noor	**A Database for an Inquiry-based Molecular Evolution Laboratory Exercise for College Courses: Whither Art Thou Selection?**	A gateway course in Biology, Genetics and Evolution will be enhanced through the design of a new software interface to simplify data entry by students, and will enable hundreds of undergraduates to conduct a research project during the course.	$4,167

ORGANIZATION / PRIMARY	PROJECT TITLE	PUBLIC INFORMATION SUMMARY	GRANT AMOUNT
Elizabeth City State University / Adedeji, Dolapo	**Incorporation Of Laboratory Activities Into Genomics and Proteomics Course**	The award will fund planning for curriculum and course development within the Pharmaceutical Science Program at Elizabeth City State University.	$5,000
Friends of the Museum / Flint, Christy CO-PI/Ms. Kimberly Kandros	**Genomics & Microbiology Investigate Lab at the Nature Research Center**	The award will support the purchase of microscopes needed for the Genomics & Microbiology Investigate Lab within the new Nature Research Center at the North Carolina Museum of Natural Sciences. These microscopes will enable hands-on, experiential learning about microbiology and biotechnology for visitors of all ages.	$40,720
North Carolina Association for Biomedical Research / Wilkison, Suzanne	**"Rx for Science Literacy" K–12 Curriculum Expansion**	Three units will be added to NCABR's biomedical science curriculum "Rx for Science Literacy: The What, Where, How and Why of Health Science Research", for students in grades 9-12. These units will focus on biomedical fields of increasing significance in North Carolina: (1) Regenerative Medicine, (2) Nanobiotechnology, and (3) Vaccines.	$72,820
North Carolina State University / Rabah, Ghada	**Closing the Gap Between the Academic Chemistry Labs and the Biotechnology Market: Development of Bioanalytical Experiments for the Undergraduate Chemistry and Biochemistry Laboratories**	The award will fund the purchase of two High Performance Liquid Chromatography (HPLC) instruments, a critical tool used in both the biotechnology and pharmaceutical industries. New HPLC-based lab experiments will be incorporated into existing undergraduate Chemistry and Biochemistry courses, teaching analytical skills that are in high demand in industry.	$68,339
Pitt Community College / Paine, Olga	**Pharmaceutically-Driven Addition of Biotechnology Course at Pitt Community College**	The award will provide the necessary equipment to teach the laboratory skills that are needed by employees of local pharmaceutical companies. On average, 85% of the graduates of the Pitt Community College A.A.S. program in Biotechnology find employment working in pharmaceutical laboratories, most often in eastern North Carolina.	$19,137
UNC – Asheville / Ward, Jennifer Rhode CO-PI/Dr. Jonathan Horton	**Infusing Biotechnology into the Undergraduate Plant Sciences Curriculum**	Funding of this project will support the redesign of undergraduate plant science courses at UNC – Asheville to incorporate hands-on biotechnology across the curriculum using an inquiry-based approach.	$30,808
UNC – Charlotte / Schlueter, Jessica CO-PI/Dr. Jennifer Weller	**Genomic Technologies in Bioinformatics**	Two new courses in genomic laboratory methods will be created, featuring the use of an Ion-Torrent next-generation sequencer within the Bioinformatics Program. Students completing these lab courses and subsequent computer-intensive coursework in Bioinformatics will have two skill sets rarely found together, and which should make graduates highly employable.	$58,670
UNC – Pembroke / Smith, Rachel CO-PI/Dr. Cornelia Tirla	**Modernization of Organic Chemistry Laboratory Equipment and Curriculum**	Scientific instrumentation purchased through this award will permit the redesign of the laboratory components of the Introductory Organic Chemistry I and II course sequence. Students will have the opportunity to work with these instruments while learning modern methods of chemical synthesis, purification, and characterization.	$62,641
		Total EDUCATION ENHANCEMENT GRANT (11 items)	**$481,982**

Education & Training Workshop

ORGANIZATION / PRIMARY	PROJECT TITLE	PUBLIC INFORMATION SUMMARY	GRANT AMOUNT
Appalachian State University / Johnson, Phillip	**Bio-monitoring of Genetically Modified Organisms**	This three-day workshop for high school science teachers explored contemporary societal issues associated with the production and detection of genetically-modified (GM) crops. Participants learned about recombinant DNA technology relevant to GM crops, their safety, how they are regulated, and methods for their detection in food and the environment.	$12,962
North Carolina Central University / Oldham, Carla	**Introductory Biotechnology Workshop for High School Teachers**	High school biology and chemistry teachers learned the background knowledge and technical skills required to teach biotechnology to high school students, and return to their classrooms ready to engage their students in hands-on science. Participants also learned about biotechnology applications in North Carolina and biotechnology careers.	$20,350
North Carolina State University / Rose, Robert	**Three Week Intensive Workshop in Molecular Biology for High School Teachers**	Teachers sub-cloned the gene coding for the jellyfish green fluorescent protein into *E. coli*, generating fluorescent bacteria. Then they developed and tested their own lab activities, based on the techniques learned during the workshop, to take back to their own classrooms.	$24,487

ORGANIZATION / PRIMARY	PROJECT TITLE	PUBLIC INFORMATION SUMMARY	GRANT AMOUNT
UNC – Asheville / Ward, Jennifer Rhode	**Stem Cells: Their Sources, Therapeutic Uses, and Fates**	The great therapeutic potential of stem cells together with the legal and ethical issues surrounding their use have made this a hot topic in biotechnology. This workshop prepared high school teachers to discuss stem cell therapies and issues with their students, and teach them related biotechnology lab techniques.	$21,816
UNC – Charlotte / Warner, Jennifer	**Microbial Magic Workshop for Middle School Teachers**	Middle School teachers learned basic scientific concepts and techniques in biotechnology, as well as how to teach these effectively, and integrate them into standard curricula. The activities in this workshop are designed to be inexpensive, require minimal preparation by the teacher, and to grab the attention of the students.	$20,790
UNC – Charlotte / Warner, Jennifer	**Biotechnology Basics Workshop for High School Teachers**	The workshop is designed for high school teachers who want to have high impact biotechnology activities for their students but who are limited by time constraints in the classroom. Participants will learn basic scientific concepts and techniques in biotechnology, as well as how to get the maximum impact out of a condensed biotechnology unit.	$16,754
UNC – Wilmington / Pyott, Sonja	**Introductory Biotechnology Workshop for High School Teachers at the University of North Carolina Wilmington**	Through a blend of lecture, discussion, and hands-on activities, workshop participants learned fundamental biotechnology concepts. Activities gave participants the opportunity to learn skills including gel electrophoresis, restriction analysis, PCR, and bioinformatics during this five-day workshop.	$24,355
		Total EDUCATION & TRAINING WORKSHOP (7 items)	**$141,514**

Institutional Development Grant

ORGANIZATION / PRIMARY	PROJECT TITLE	PUBLIC INFORMATION SUMMARY	GRANT AMOUNT
Appalachian State University / Puckett, Libby	**Instrumentation for the Advancement of Multi-Disciplinary Research at Appalachian State University**	This award is for an automated capillary electrophoresis (CE) instrument with UV/Vis and laser induced fluorescence (LIF) detection that will become a multi-user instrument for the College of Arts and Sciences. This instrument has a broad range of applicability and will provide support and service to a number of programs from the College, including the Forensic Science Program, the Fermentation Sciences Program, and the Environmental Science Program.	$97,588
Duke University / Liu, Yutao	**Duke Acquisition of a Mid-range DNA Sequencer for Molecular Genomics Core**	Funds were received for purchase of a MiSeq Personal Sequencing System from Illumina. This compact and economical system has a wide range of sequencing applications; it will be used to study genes in a number of human diseases, including MS, cardiovascular disease, and glaucoma. This new system will be complementary to the existing service, augmenting the available DNA sequencing capabilities at Duke significantly and covering new areas that are currently lacking.	$101,000
Duke University Medical Center / Farsiu, Sina	**Ultrahigh-Resolution Adaptive Optics Optical Coherence Tomography/Scanning Laser Opthalmoscopy System**	Faculty at the Duke Eye Center will assemble an adaptive optics-enabled scanning laser ophthalmoscope and spectral-domain optical coherence tomography imager. This system provides novel high resolution imaging capabilities to clinical and basic science investigators who are investigating vision loss and neurodegenerative diseases. It will enable them to discover and evaluate imaging biomarkers, monitor disease progression, and evaluate drug efficacy on a cellular level.	$200,000
East Carolina University / Sutherland, John	**Circular Dichroism Spectrometer for Characterization of Proteins and other Biomolecules in the Far and Vacuum Ultraviolet**	Proteins are important in many aspects of biotechnology. Ultraviolet circular dichroism (CD) is a powerful tool for studying the structure of proteins in solution. The researchers will build and test a CD instrument that is optimized for measuring the CD of proteins in the short-wavelength ultraviolet region of the spectrum, which provides the most information on protein structure. The completed instrument will be available for use by scientists at East Carolina University and other institutions in the state.	$54,019
UNC – Chapel Hill / Frye, Stephen	**Acquisition of a Tecan EVO 200 Robotic Sample Processor for UNC-CH CICBDD**	UNC created the Center for Integrative Chemical Biology and Drug Discovery (CICBDD) to bring drug discovery expertise to bear on biological targets under investigation by UNC faculty. These funds will be used to acquire a replacement robotic system that is critical to the operations of this center.	$200,000
UNC – Chapel Hill / Fisher, Nancy	**BC Gallios (TM) Flow Cytometer to Advance Microparticle Research at UNC Chapel Hill**	The UNC Flow Cytometry Core Facility received support for the purchase of a flow cytometer for the study of microparticles (MPs). MPs are tiny membrane vesicles that are released from cells and are postulated to play a role in coagulation, thrombosis, cancer, sepsis and autoimmune disease.	$136,000
UNC – Chapel Hill / Kashuba, Angela	**UPLC-MS/MS to Support Preclinical and Clinical Pharmacology Studies in HIV Treatment and Prevention**	This equipment will provide much needed support to the UNC Center for AIDS Research investigators for studies that require high sensitivity to test for compounds at low concentrations in tissues. The equipment will have increased sensitivity needed to conduct new projects focused on HIV prevention and cure.	$200,000

ORGANIZATION / PRIMARY	PROJECT TITLE	PUBLIC INFORMATION SUMMARY	GRANT AMOUNT
UNC – Chapel Hill / Superfine, Richard	**Nanomanipulation System for Biomedical Research and Development**	Funds were awarded to assemble a molecular manipulation system consisting of an Inverted Fluorescence Microscope and an Atomic Force Microscope as part of a molecular manipulation system, a unique tool that will be used for studies of biomechanical properties of blood clots, mechanical signaling, and signaling pathways related to cell motility, mechanical studies of cancer cells as it relates to metastasis, mucus adhesion and ciliary mechanical studies related to cystic fibrosis, among others.	$165,473
Wake Forest University Health Sciences / Lowther, Todd	**Enhancement of X-ray Crystallography at Wake Forest Biotech Place**	This proposal is to enhance the X-ray crystallography capabilities at Wake Forest School of Medicine (WFSM). The X-ray Crystallography facility will be enhanced in two ways: upgrade of the mirrors and the purchase of a state-of-the-art micro-crystallization system. These changes and equipment acquisition will reduce electricity usage and service contract costs, while greatly improving data collection, crystal growth and optimization. These improvements will advance the development of novel therapeutics to target a variety of diseases.	$199,720
Western Carolina University / Wilson, Mark	**Purchase of Applied Biosystems 3500 HID Genetic Analyzer to Establish DNA Sequencing Core Facility at Western Carolina University**	The Forensic Science Program will purchase an Applied Biosystems 3500 HID Genetic Analyzer. This instrument, combined with DNA analyzers already on campus, will become part of a new DNA sequencing core facility at WCU operated by the Forensic Science Program and utilized by researchers from a multitude of scientific disciplines.	$174,572
		Total INSTITUTIONAL DEVELOPMENT GRANT (10 items)	**$1,528,372**

Industrial Fellowship Program

COMPANY/ MENTOR	FELLOW	GRANT AMOUNT
CiVentiChem, LLC / Venepalli, Bhaskar	Industrial Fellowship Support – Joseph Kaloko, Year 2	$48,560
Glaxo SmithKline / Crowder, Timothy	Industrial Fellowship Support – Dana Peles, Year 1	$37,000
GrassRoots Biotechnology Inc. / Eisner, Douglas	Industrial Fellowship Support – Patrick Vincent-Pope, Year 2	$48,560
KeraNetics, LLC / Burnett, Luke	Industrial Fellowship Support – Erin Flaco, Year 1	$47,000
Liquidia Technologies / Maynor, Ben	Industrial Fellowship Support – Katherine Horvath, Year 1	$42,000
Metabolon, Inc. / Lawton, Kay	Industrial Fellowship Support – Meredith Brown, Year 2	$43,560
Onoscope, Inc / Gebhart, Steven	Industrial Fellowship Support – Benjamin Moody, Year 2	$48,560
Parion Sciences / Thelin, Bill	Industrial Fellowship Support – Diane Villalon, Year 1	$47,000
SePro Corporation / Bunnell, Todd	Industrial Fellowship Support – Jessica Koczan, Year 1	$42,000
Zen-Bio Inc. / Pieraccini, Peter	Industrial Fellowship Support – Sarah Compton, Year 2	$48,560
	Total INDUSTRIAL FELLOWSHIP PROGRAM (10 items)	**$452,800**

Industrial Internship Program

COMPANY/ MENTOR	INTERN	GRANT AMOUNT
Aerial Biopharma LLC / Butts, Stephen	Industrial Internship – Deepika Poranki	$3,000
G1 Therapeutics, Inc. / Chant, John	Industrial Internship – Manish Agrawal	$3,000
Galaxy Diagnostics, Inc. / Elam, Amanda	Industrial Internship – Eric Fish	$3,000
Heat Biologics, Inc. / Wolf, Jeffrey	Industrial Internship – Michael Blanks	$3,000
KeraFAST, Inc. / Cary, Zachary	Industrial Internship – Jessica Cotton	$3,000
NC Biosciences Organization / Taylor, Samuel	Industrial Internship – Shannon Jones	$3,000
NovaTarg, Inc. / Batchelor, Kenneth	Industrial Internship – Rachel Song	$3,000
	TOTAL INDUSTRIAL INTERNSHIP PROGRAM (7 ITEMS)	**$21,000**

Multidisciplinary Research Grant

ORGANIZATION / PRIMARY	PROJECT TITLE	PUBLIC INFORMATION SUMMARY	GRANT AMOUNT
Duke University / You, Linchong	**Modeling, Microfluidics and Quantitative Single Cell Signaling Dynamics**	Signaling pathways regulate cell cycle progression and cell fate decisions in normal and cancerous cells. The proposed research aims to develop a suite of experimental tools, including genetic tools and microfluidic devices, to manipulate and measure cell signaling dynamics in mammalian cells. This work has implications for understanding development and treatment of cancer.	$250,000
East Carolina University / Lu, Qun	**Cell-Cell Junction Protein as Biomarker for Prostate Cancer**	This project will test a non-invasive urine assay based on the over expression and high frequency gene mutations in a unique protein, delta-catenin, in prostate cancer. The success of this project will provide the foundation to investigate whether delta-catenin-based assays are a potentially better prostate cancer biomarker for development of a new diagnostic test.	$250,000
North Carolina State University / Ashwell, Melissa	**Genetic Variation of Plasma Disposition Kinetics and Liver Gene Expression in the Pig and their Implications on Animal Welfare and Drug Efficacy**	Current FDA drug withdrawal times in swine are based on information from relatively few animals and do not take into account differences among breeds. This approach may result in drug administration at too low or too high levels, increasing veterinary costs and possibly cultivating drug resistance. This project will examine drug withdrawal times in pig breeds to evaluate genetic variation in drug metabolism.	$249,979
North Carolina State University / Carbonell, Ruben	**Disposable, High-Throughput High-Capacity Antibody Capture Membrane with In-Line Sensors**	Current techniques for purification of antibody therapeutic drugs are costly. This is a proposal to develop a novel membrane that will improve production of antibody therapeutic drugs, making it less costly, faster and more efficient. The proposed system consists of a small molecule that can recognize specific antibodies in a complex mixture and capture them in an open fibrous membrane structure.	$250,000
UNC – Wilmington / Bourdelais, Andrea	**Development of Ladder Frame Polyethers as Drug Escortins**	A major hurdle in the development of new therapeutic drugs is getting them inside cells and to their site of action. This proposal aims to develop both natural and synthetic compounds, called ladder frame polyethers, as drug carriers to improve the cellular uptake of drugs with low membrane permeability.	$249,404
		Total MULTIDISCIPLINARY RESEARCH GRANT (5 items)	**$1,249,383**

Presidential Initiative Award

COMPANY/ PRIMARY	INITIATIVE	GRANT AMOUNT
Bent Creek Institute, Inc / Cumberford, Greg	Targeted Services to Promote Agricultural Biotechnology-Related EconomicDevelopment Efforts in N.C.'s Western Region.	$50,000
North Carolina's Northeast Financing Alliance, Inc. / Rogerson, Vann	Marketing Development – Pilot Extraction Facility in Bertie County, N.C.	$50,000
	Total PRESIDENTIAL INITIATIVE AWARD (2 items)	**$100,000**

Regional Development Grant

ORGANIZATION / PRIMARY	PROJECT TITLE	PUBLIC INFORMATION SUMMARY	GRANT AMOUNT
Pitt County Development Commission / Andrews, Kelly	**Eastern Region Bio Competitive Positioning Analysis**	Pitt County, part of North Carolina's Eastern Region, will take the lead on a competitive positioning analysis to determine the biotechnology sectors for which it is best suited for marketing and recruitment. This analysis will build on previous studies that identified biotechnology as a viable target for the Region.	$42,000
Research Triangle Foundation of North Carolina / Rooks, Liz	**Medworks Joint Project**	The Research Triangle Foundation of North Carolina and First Flight Venture Center will collaborate to create four wet labs and a shared resource space at Park Research Center. Tenants will operate under the First Flight Venture Center model, which includes educational and support programs for life science entrepreneurs.	$65,000
Wake Forest University Health Sciences / Mizel, Steven	**Development of the North Carolina Center for Vaccine Innovation**	Vaccine development has had a dramatic resurgence due to antibiotic resistance microbes and the threat of bioterrorism. North Carolina has become a major center for vaccine production as well as vaccine development – including novel adjuvant and vaccine vector platforms. A strategic plan will be developed for a proposed North Carolina Center for Vaccine Innovation that will serve as a focal point and catalyst for vaccine development in N.C.	$53,662
		Total REGIONAL DEVELOPMENT GRANT (3 items)	**$160,662**

Strategic Growth Loan

ORGANIZATION / PRIMARY	PROJECT TITLE	PUBLIC INFORMATION SUMMARY	GRANT AMOUNT
Arbovax, Inc. / Thomas, Malcolm	**Testing of a Tetravalent Dengue Vaccine in a Non-human Primate Model**	Arbovax is developing vaccines for insect-borne viral diseases. The company's initial target is dengue virus, a pathogen that infects more than 50 million people and kills more than 20,000 each year. Arbovax will use the SGL to partially fund non-human primate trials of its tetravalent dengue vaccine candidate.	$250,000
Heat Biologics, Inc. / Wolf, Jeffrey	**Heat Biologics, Inc.**	Heat Biologics is developing its proprietary "ImPACT" (Immune Pan-Antigen Cytotoxic Therapy) off-the-shelf therapeutic vaccines for oncology and antiviral applications. Heat will use the SGL to prepare and file an Investigational New Drug application to the US Food and Drug Administration for its bladder cancer program.	$250,000
		Total STRATEGIC GROWTH LOAN (2 items)	**$500,000**

Small Business Research Loan

ORGANIZATION / PRIMARY	PROJECT TITLE	PUBLIC INFORMATION SUMMARY	GRANT AMOUNT
Applied Catheter Technologies Inc. / Wilson, Jon	**Proposal for Optimal, Novel Synthesis of Halofuginone**	ACT is a medical device company located in Winston-Salem in the Piedmont Triad Research Park. Applied Catheter Technologies's (ACT) core technology is a drug coating, whose active ingredient, halofuginone (halo) is known to prevent adhesion, or scar tissue formation. Prevention of scar tissue formation on indwelling and implanted medical devices and after surgery is of importance as adhesions can compromise the effectiveness of an implanted device or affect the function of an operated organ or adjacent organs Funds from the SRL will be used to develop a novel, efficient and scalable synthesis of halofuginone enriched with the "active" chiral form.	$211,003
CivaTech Oncology, Inc. / Hoedl, Seth	**CivaSheet Bio-Compatibility Studies**	CivaTech Oncology is developing novel, polymer encapsulated brachytherapy devices for use in radiation oncology. CivaTech already has one product with 510(k) clearance in its portfolio, a linear radiation source called CivaString designed to treat prostate and breast cancer. CivaTech plans to use the SRL funds to advance preclinical development of a second product, CivaSheet, which is intended for use in lung cancer.	$249,048
G1 Therapeutics, Inc. / Strum, Jay	**G1 Therapeutics Small Business Loan (SBL) for NCBC**	G1 Therapeutics is developing small molecule agents to protect the bone marrow and other tissues from DNA-damaging agents, chemotherapy and radiation exposure. G1 has termed its novel mechanism of bone marrow protection as PharmacoQuiescence™ (PQ). In animal models, G1 has demonstrated robust protection of the bone marrow from chemotherapy and acute radiation exposure. G1 is seeking the SRL to further develop its lead compounds (cyclin-dependent kinase [CDK] 4/6 inhibitors) for chemoprotection in patients receiving systemic chemotherapy.	$250,000
Trana Discovery / Peterson, Steven	**Trana Discovery**	Projects will illustrate the proposed mechanism of action for bioactive hits active against HIV and Staph aureus are essential and unique among anti-infective therapies. The NMR results will confirm and allow identification for future combinatorial chemisty work and for *S. aureus*, the footprinting will confirm where the bioactive hits impact the ribosome.	$35,000
Zoion Pharma Inc. / Mossinghoff, Gregory	**Zoion Pharma Inc.**	Zoion Pharma, Inc. plans to identify human therapeutic products and development programs that can be successfully deployed in animal health indications. Zoion's lead product, ZP-1, is a topical epithelial sodium channel (ENaC) inhibitor in development for canine keratoconjunctivitis sicca (KCS, also called "dry eye"). Proceeds from this loan would primarily fund additional clinical testing of ZP-1.	$50,000
		Total SMALL BUSINESS RESEARCH LOAN (5 items)	**$795,051**

Technology Enhancement Grant

ORGANIZATION / PRIMARY	PROJECT TITLE	PUBLIC INFORMATION SUMMARY	GRANT AMOUNT
Duke University / Berger, Henry	**Commercial Scale Fabrication of POEGMA-Coated Slides and Development of POEGMA-Coated Microplates**	This proposal will scale up the current manufacturing process of a surface coating technology that utilizes a non-fouling, nanoscale polymer brush surface to eliminate spurious adsorption of cells and proteins, with applications in clinical diagnostics. The proposed work will thereby enhance the commercial viability of this technology.	$50,000
North Carolina Central University / Hoffler, Undi	**Method for Sorting Pure Pancreatic Beta Cells from Dispersed Human Islets Using a Novel Transient Fluorescent Pre-pro-insulin Reporter**	Proposed studies seek to produce viable purified human pancreatic beta-cells from donor pancreatic tissue using a novel fluorescent reporter. This technology will enhance diabetes drug discovery efforts and be an important first-step towards transplantation of competent beta-cells into diabetic patients to restore normal pancreatic insulin secretion.	$50,000
		Total TECHNOLOGY ENHANCEMENT GRANT (2 items)	**$100,000**

Undergraduate Biotechnology Research Fellowship

ORGANIZATION / PRIMARY	PROJECT TITLE	PUBLIC INFORMATION SUMMARY	GRANT AMOUNT
Appalachian State University / Hester, Brooke	**Optical studies of Organic Anion Transporters in Hydrosomes (Tyler Foley)**	The student fellow will construct an apparatus capable of optically studying isolated single molecules. With this instrument, the student will study the properties of membrane ion transporters.	$5,000
Davidson College / Sarafova, Sophia	**Duke-Davidson Immunology Program (Gregory Swan)**	One Davidson College undergraduate student will receive 10 weeks of intensive training in a laboratory at Duke University that uses biochemical approaches to identify therapeutic targets in the combat against autoimmunity, allergy, and cancer. The experience will strengthen the Duke-Davidson Immunology Partnership that aims to provide interdisciplinary collaborative educational opportunities.	$5,000
Meredith College / Edwards, Cynthia	**Bioassay of a Natural Insect Repellent, "Adios Outdoor Spray" (Jacqueline Bailey)**	The purpose of this project is to conduct industry-relevent research in conjunction with a local company, JustNeem, LLC., which produces a natural neem-based mosquito repellent. This research will focus on conducting a laboratory evaluation of various concentrations and formulations of "Adios Outdoor Spray" against *Aedes albopictus* (Asian Tiger Mosquito).	$4,450
North Carolina State University / Day, Judy	**Cell-Free Ultrahigh-Throughput Screens for the Directed Evolution of Glycosyltransferases (Hemant Desai)**	The utility of glycosyltransferases (GTs) is limited by their strict specificity. This proposal aims to develop an ultra high-throughput screen for reporting the activity of millions of mutant GTs. This research will improve our understanding of GT specificity and provide novel enzymes for drug discovery.	$5,000
North Carolina State University / Day, Judy	**Development of Biotechnology Tools to Assess Reproductive Health of Blue Crab Populations (Kevin Kearney)**	Research will be conducted to develop biotechnology tools for measuring activity of the reproductive hormone, methyl farnesoate, in blue crabs. These tools will prove important for monitoring the sustainability of economically important blue crab populations along coastal North Carolina.	$5,000
North Carolina State University / Day, Judy	**Recombinant Expression of a Thermostable Lipase from *Metallosphaera sedula* for Algae Biofuel Production (Rachel Turner)**	There are dwindling supplies of petroleum-based fuels. Algae are promising feedstocks for biofuels. However, viability of algal biofuel production requires improvement of algal free fatty acid synthesis (fatty acids are fuel conversion substrates). Treatment of algae with thermostable lipases could enhance availability of algal free fatty acids for fuel conversion.	$5,000
UNC – Charlotte / Brown, Banita	**Recovery of Viable Zone-specific Hepatocytes from Cardiac Death Donor Livers (Joshua Wheaton)**	This is a proposal for an undergraduate research experience to perform a project to support the development of an innovative method for isolating liver cells from human livers that cannot be used for transplant and are currently not suitable for research.	$5,000
		Total UNDERGRADUATE BIOTECHNOLOGY RESEARCH FELLOWSHIP (7 items)	**$34,450**
		Grand Totals (127 items)	**$8,648,062**

The North Carolina Biotechnology Center is a private, nonprofit corporation supported by the N.C. General Assembly. Its mission is to provide long-term economic and societal benefits to North Carolina by supporting biotechnology research, business, education and strategic policy statewide.

North Carolina's over 500 companies and 58,000-plus employees are a result of the state's consistent investment in life sciences – $100 million per year on average for the last 12 to 15 years. The Biotechnology Center serves as the hub for that community, making connections among academic, business and civic leaders. The Center delivers a spectrum of technology-based economic development programs to spur innovation, education, commercialization and job creation.

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